

REMARKS

Reconsideration and further examination of this application is respectfully requested. The Office Action mailed on November 18, 2003 and the references cited therewith have been carefully reviewed and considered. Claims 1-22 were last presented for examination. Claims 1, 3 and 5 have been amended. Claims 1-22 are now presented for further examination.

In brief, the present claimed invention is directed to routing data through a switch fabric between an end user and a computer or computer network. Each storage device and host processor sends message packets through an internal switch, or switched fabric, which can then send message packets to the intended recipient. The initiator (the storage device or host processor) of a message packet establishes a data transfer path through the switched fabric to the recipient. Such a data transfer path can be established between a storage device and another component inside the data processing device generally simultaneously with another data transfer path(s) through the switched fabric. The host-side and storage-side interfaces send and receive data to and from the host device and the storage devices, respectively. The switch matrix connects to the host-side and storage-side links and establishes communication channels for transferring message packets including the data between the host device and any of the storage devices.

Objections

Claims 1, 3, and 5 were objected to because of informalities. They have been corrected in accordance with the examiner's requirements.

Rejections under 35 U.S.C. § 103

Claims 1, 2, 5, 11-15, and 22 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Brendel et al. (US Patent 5,774,660) in view of Opher et al. (US Patent 5,345,558). Examiner noted similarities between the claimed invention and the references regarding a host side link connected to a router and the router connected to a storage system. Examiner has asserted that it would have been obvious to substitute the

switch matrix of Opher with the web balancing system and router of Brendel to show functional similarities with the claimed invention.

Brendel, et al. (hereinafter "Brendel"), discloses a multi-node server for transmitting world-wide-web pages to network-based browser clients. A client connected to a computer network, or server farm, typically has asymmetric data requirements, wherein the client downloads large amounts of data from a web page but only transmits small amounts of data in the form of requests. Hence, the web site has a network connection point for receiving and transmitting data packets to and from the computer network in response to a client browser. The network connection point, or router load-balancer, contains several nodes with algorithms used to balance data loads between the client and the network. This system is only for communication between a client and the network and hence only requires switches between the router load-balancer and the network.

Brendel does not disclose sending browser information to client browsers other than the browser client requesting information from the web page. Brendel does not show a need for a network to send web page correspondence to anyone other than the client browser soliciting information from a web page. In fact, it would be counter productive to send unsolicited web page information that one client browser is using to other unsuspecting clients. For this reason, Brendel only needs a switching system between the router load-balancer and the servers as shown in FIG. 4.

Applicant claims distinguish from Brendel by claiming a switch matrix connected to both the host side link and the storage side links. For example, amended claim 1 recites "a switch matrix connected to the host-side and the storage-side links..." Brendel does not teach or suggest, in any way, a switch matrix connected to a host-side. Rather Brendel is communicating between a singular user and a web-site on a network.

Opher, et al. (hereinafter "Opher"), discloses a topology-independent method and apparatus for avoiding continuous looping of transmission of cells and for allowing

broadcast of cells in a network implementing Asynchronous Transfer Mode ("ATM") or similar networking architectures. Opher defines cells as fixed-sized slots that hold an information packet which includes a "well-defined and size-limited header area and a user information area", (col.1 37-38). The header area comprises two fields, a virtual channel identifier and a virtual path identifier, used for routing the cell. Opher has found that in some cases the header area of a cell to be broadcast is "misused" (i.e., used other than in conformance with the established standards) to include a first area indicating that it is a broadcast cell, a second area having expiration information and a hop count (a counter to facilitate expiration of forwarding the packet at some point in the packet's life). A station sending the cell formats the header and then transmits the cell onto the network. The cell is then received by a switch which examines the header information to determine if the cell is a broadcast cell and where that cell and broadcast should go, with exception to the port the cell was received on. In the event that the cell is expired, due to the hop count and/or other expiration information, expiration algorithms need to be invoked to avoid a continuous looping of transmission.

Opher uses a multi-directional switching network for purposes of broadcasting cells as can be seen in Figure 2. Opher transmits a cell, or cells, from one broadcast port, or a client site, to many different sites but limits the broadcast port from receiving its own broadcast cell. Opher discloses that there is no need for an origination source to receive broadcast information from itself. This is explained in broadcast rules as set forth by Opher as exemplified in the passage, "if an attempt is made by device 421a to broadcast a cell on the network described in connection with FIG. 4, the broadcast cell may loop forward absent some constraint imposed by the network..." (col. 7, l. 40-45).

Further, Opher teaches away from communication channels between the host-side link and the storage devices. Opher, excludes two way communication between the host and the network by reciting broadcast rules that do not permit output information to be received by all ports except the output port, or host. For example, Opher discloses that, "it can be seen that the broadcast cell would be received on port 411a and, in accordance

with the broadcast rules of outputting the cell on all ports except for the port it was received on..." (col. 7, l. 44-47).

Even, assuming arguendo, that the references could be combined, such a combination still fails to teach the novel and unique aspects of a switch matrix connected to both the host side link and the storage side links for bidirectional communication as in claim 1 of Applicant's claimed invention. Claim 1 recites, "...a host-side link connected to the host device and including a host-side interface to the host device, the host-side interface sending and receiving data to and from the host device... a switch matrix connected to the host-side link and the storage-side links and operative to establish communication channels between the host-side link and any of the storage-side links for transferring message packets..."

Independent claim 15 has similar limitations and distinguishes for the same reasons as stated above. For example claim 15 recites, "...establishing one of the data transfer paths between the host device and the selected storage device through the switched fabric... transferring data between the host device and the selected storage device in response to the data access request through the established data transfer path in the switched fabric between the host device and the selected storage device."

Because Brendel and Opher fail to collectively disclose the limitations of claim 15, even if they could be combined, such a combination still fails to show the limitations of claim 15.

Independent claim 22 also has similar limitations and distinguishes for the same reasons as stated above. For example claim 22 recites, "...a host-side link integrated in the switch and connected to the host device and including a host-side interface between the switch and the host device, the host-side interface sending and receiving data to and from the host device... a switch matrix integrated in the switch and connected to the host-side link and the storage-side links and operative to establish communication channels

between the host-side link and any of the storage-side links for transferring message packets...”

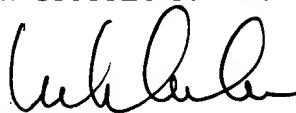
Because Brendel and Opher fail to collectively disclose the limitations of claim 22, even if they could be combined, such a combination still fails to show the limitations of claim 22.

Claims 2, 5, 11-14 depend from claim 1 and therefore distinguish from the art of record for the same reasons as set forth above.

For all of these reasons, the present invention is considered to be allowable over the prior art of record.

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